



Q U A L I T Y S U R V E I L L A N C E

Section I G E N E R A L

Quality Surveillance Organization

The organization for quality surveillance of petroleum products is under the control of the theater army commander. Base laboratories assigned or attached to the petroleum group, base laboratory sections organic to petroleum pipeline and terminal operating battalions, and mobile laboratories attached to petroleum supply battalions are the operating elements of the quality surveillance structure in the theater army.

Quality Surveillance Mission

The quality surveillance mission is to maintain the quality of petroleum products from point of origin to point of use. The quality surveillance program encompasses, but is not limited to, bulk fuel in waterborne carriers, tank cars, tank vehicles, pipeline systems, bulk storage, and packaged products. This includes inspecting, sampling, testing, handling, and performing preventive maintenance. The mission is also to recommend and assist in recovering, upgrading, downgrading, or disposing of products. To accomplish this mission, the appropriate petroleum organization--

- Operates and maintains laboratories to test all petroleum products in the command in a reasonable time. Data on testing procedures are contained in the appropriate ASTM or FTMS standard. Military Handbook 200, FM 10-71, and FM 10-72 provide guidance and requirements for a quality surveillance system.

- Provides advisory technical assistance to military activities in the theater, particularly in recovering and downgrading products. Laboratory personnel must spend a substantial part of their time in the field on inspections and in connection with quality surveillance problems that arise. When products tested do not meet deterioration limits, laboratory personnel recommend, through channels, alternate use, reclamation, or disposal.

- As required, inspects petroleum products procured in the theater.

- As required, gives technical assistance and performs laboratory analysis for Air Force, Navy, and other commands and agencies.

Responsibilities for Quality Surveillance

In order to meet specifications set at DOD level, products undergo quality surveillance from the time they are procured until they are used. Therefore, there must be a quality surveillance program throughout the theater of operations.

- The joint petroleum officer, responsible to the theater commander, insures there is a quality surveillance program within the command and monitors and assists in this program. He may be assisted by joint area petroleum offices (JAPOs) or subarea petroleum offices (SAPOs).

- The theater army command is responsible for setting up and maintaining a quality surveillance program for fuels and lubricants furnished to users by the theater army. The program for bulk and packaged products is carried out by the petroleum group through its petroleum pipeline and terminal operating battalions. A petroleum quality surveillance program is required at all levels of command and will be accomplished by the appropriate petroleum personnel assigned.

Personnel Competence

An effective quality surveillance program requires properly trained personnel. Everyone concerned with handling fuels and lubricants should be suitably trained and able to perform his or her duties. Although the handling of fuels and lubricants presents many hazards, products can be handled safely if product characteristics are understood and precautions are taken. Good house-keeping practices will insure order and cleanliness and will promote safety.

Product Contamination

Basic sources of product contamination are water, dirt, rust, and scale, and intermixing of products. Products may also be contaminated with chemical or biological mate-

rials that may not be readily visible. Contaminants change the quality of a product by adding undesirable characteristics that make the product unsuitable for its intended use.

Product Deterioration

Certain changes occur in stored products and become more marked as the product ages. These changes, which are forms of product deterioration, are mostly the result of natural causes. Although deterioration may be initiated or hastened by storage conditions, it is not usually observable to fuel-handling personnel. The most common forms of product deterioration are weathering, which is the loss of the more volatile components; gum formation; and the loss of oxidation inhibitors, tetraethyllead, and anti-icing agents. The degree of deterioration can be determined only by periodic laboratory testing.

Captured Petroleum Products

Sampling, testing, and other forms of quality surveillance are also done to captured products. The purpose of such tests or analyses is to identify the products and to make recommendations as to their use, reclamation, or disposal.

Section II

PROCEDURES FOR QUALITY SURVEILLANCE

General

Deterioration limits are tolerances established to permit use, under certain conditions, of products that do not fully meet specifications. When petroleum products do not meet the deterioration limits, quality surveillance personnel report the facts and circumstances and recommend alternate use or disposition to the petroleum group or COSCOM materiel management center (MMC) and advise the JPO. Proposed recovery measures are also reported, if appropriate. On packaged products, the petroleum group reports this

information to the CONUS national inventory control point (NICP). On bulk product and packaged fuel, the petroleum group notifies the JPO of the facts, circumstances, reclamation measures taken or recommended, and the need for replacement supply. In turn, the JPO informs the Defense Fuel Supply Center (DFSC). The petroleum group performs such recovery measures as are approved. The minimum frequencies for testing products are listed in Military Handbook 200.

Types of Tests

Type A is a procurement inspection test. Types B-1, B-2, B-3, and C are performed in quality surveillance testing (see Military Handbook 200). In addition, visual checks for appearance, water, and sediment are made on samples at filling points for rail tank cars, tank vehicles, and containers before filling and when changing to fresh fuel tanks and containers. Such checks are also made on delivery-line samples or all-levels samples from tank cars and tank vehicles after loading and before discharge. The types of tests and minimum test requirements are given in Military Handbook 200.

- Suspected contamination of products should be confirmed by laboratory tests.
- All laboratory tests are performed in accordance with the method prescribed in the appropriate specification. Specifications and deterioration limits are absolute and are not subject to correction for tolerance of test methods. Whether or not a test and its results can be reproduced may determine if the results are acceptable. When the same test is conducted more than once on a given sample, the results are considered suspect if they differ by more than the amount specified in the test method. Minimum test requirements are given in Military Handbook 200.
- Each petroleum products laboratory maintains, through publications channels, an up-to-date file of Government fuel and lubricant specifications.

Significance of Tests

Each test of fuels and lubricants contained in the product specification has a certain significance in relation to the product tested. Some tests can give a quick, easy, and positive identification of the product in question and at the same time help to detect contaminants. A description of test equipment and test methods is in FM 10-70. Appendix E of this manual gives the significance and purpose of certain tests and may help personnel to appreciate and understand the scope and importance of the quality surveillance program.

Sampling

All samples are taken in accordance with standard procedures based on ASTM Standards on Petroleum Products and Lubricants (part 18, sampling method D270). Many precautions must be taken to insure that samples are representative. The types of precautions depend on the type of products being sampled; the tank, carrier, or container; and the sampling procedure used. Each sampling procedure is suitable for a specific product under definite storage, transportation, and container conditions. Since a sample is used for determining physical and chemical characteristics of a product, the basic principle of each procedure is to take a sample in such a manner and from such a location in the tank or container that the sample will be truly representative of the product. A description of sampling procedures and equipment is included in chapter 11 of FM 10-69.

Quality Surveillance Requirements

Quality surveillance of fuel products must begin upon receipt by the holding activity and continue until those products are delivered to the user. Detailed information regarding specific procedures used in each storage and/or transportation mode is contained in references as listed below.

- *Bulk Storage.* AR 703-1, DOD 4140.25M, Federal Test Method Standard 791, Military Handbook 200, Military Handbook 201, Military Standard 140, Military Standard 161, and Military Standard 457.
- *Bulk Transportation.*
 - *Marine.* Commander of Military Sealift Command Instructions 3121.3, DOD 4140.25M, Military Handbook 200 and Military Handbook 201.
 - *Tank Cars and Tank Vehicles.* AR 703-1, DOD 4140.25M, FM 10-69, FM 10-71, Military Handbook 200, and Military Handbook 201.
 - *Pipeline.* AR 703-1, AR 715-27, DOD 4140.25M, FM 10-18, FM 10-20, FM 10-70, FM 10-207, Military Handbook 200, Military Handbook 201, and Military Standard 161.

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- *Packaged Products.* AR 703-1, DOD 4140.25M, Military Handbook 200, Military Handbook 201, Military Standard 105, and Military Standard 290.

Reclamation

Reclamation is restoring or changing the quality of a product unsuitable for use in its present state to meet desired quality specifications. Petroleum products that do not meet

specifications are reclaimed for use by downgrading, blending, purifying, or removal of water. Products that cannot be used for their original intended purpose may be furnished for use as a lower grade of the same or similar product or for another use. If this cannot be done, they are reported not suitable for use and are disposed of in accordance with instructions issued by the appropriate inventory or stock control center.